PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : H04Q 7/32 — A1

(11) International Publication Number: WO 00/65855

(43) International Publication Date: 2 November 2000 (02.11.00)

(21) International Application Number: PCT/GB00/00522

(22) International Filing Date: 16 February 2000 (16.02.00)

(30) Priority Data:
9909617.4 27 April 1999 (27.04.99) GB

(71) Applicant *(for all designated States except US)*: ROKE MANOR RESEARCH LIMITED [GB/GB]; Roke Manor Research, Old Salisbury Lane, Romsey, Hampshire SO51 0ZN (GB).

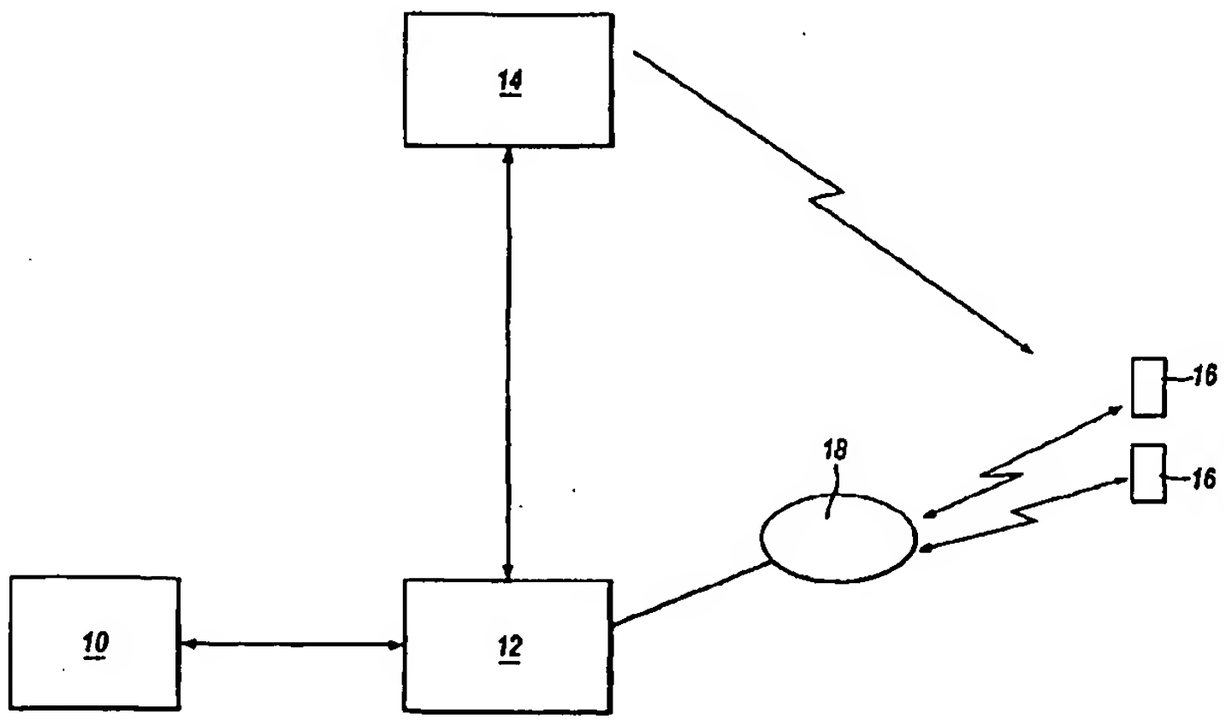
(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: HOOK, Michael [GB/GB]; 1 Tees Close, Chandlers Ford, Hampshire SO53 4RU (GB). TUTTLEBEE, Walter [GB/GB]; 51 St. Blaize Road, Romsey, Hampshire SO51 7JY (GB). CUNDALL, John [GB/GB]; 12 Forest Lake Avenue, Hightown, Ringwood, Hampshire BH24 1QU (GB).

(74) Agents: ALLEN, Derek et al.; Intellectual Property Department, Siemens Shared Services Limited, Siemens House, Oldbury, Bracknell, Berkshire RG12 8FZ (GB).

(81) Designated States: CA, JP, SG, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.

(54) Title: METHOD FOR DOWNLOADING SOFTWARE



(57) Abstract

According to the present invention there is provided a method for downloading software from a mobile network operator to a mobile phone user. The downloaded software can be new network services or user specified applications software or user specified information. The method requires the downloaded software to written as Java classes capable of running on a Java Virtual Machine. All the Java classes can be continuously broadcast at a relatively modest data rate. In an enhanced mode a list of services available for downloading is broadcast over the network more frequently then the actual services themselves. The user then selects which service he wants and only that one is downloaded. Payment can be on a subscription or pay–per–use basis. The method could also be adapted to work with one of the new digital broadcasting platforms such as DAB or DVB as a means for delivering the Java classes. This would significantly increase the volume of data which could be downloaded thus increasing the number of new services or information which could be accessed.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	**ES**	Spain	**LS**	Lesotho	**SI**	Slovenia
AM	Armenia	**FI**	Finland	**LT**	Lithuania	**SK**	Slovakia
AT	Austria	**FR**	France	**LU**	Luxembourg	**SN**	Senegal
AU	Australia	**GA**	Gabon	**LV**	Latvia	**SZ**	Swaziland
AZ	Azerbaijan	**GB**	United Kingdom	**MC**	Monaco	**TD**	Chad
BA	Bosnia and Herzegovina	**GE**	Georgia	**MD**	Republic of Moldova	**TG**	Togo
BB	Barbados	**GH**	Ghana	**MG**	Madagascar	**TJ**	Tajikistan
BE	Belgium	**GN**	Guinea	**MK**	The former Yugoslav Republic of Macedonia	**TM**	Turkmenistan
BF	Burkina Faso	**GR**	Greece			**TR**	Turkey
BG	Bulgaria	**HU**	Hungary	**ML**	Mali	**TT**	Trinidad and Tobago
BJ	Benin	**IE**	Ireland	**MN**	Mongolia	**UA**	Ukraine
BR	Brazil	**IL**	Israel	**MR**	Mauritania	**UG**	Uganda
BY	Belarus	**IS**	Iceland	**MW**	Malawi	**US**	United States of America
CA	Canada	**IT**	Italy	**MX**	Mexico	**UZ**	Uzbekistan
CF	Central African Republic	**JP**	Japan	**NE**	Niger	**VN**	Viet Nam
CG	Congo	**KE**	Kenya	**NL**	Netherlands	**YU**	Yugoslavia
CH	Switzerland	**KG**	Kyrgyzstan	**NO**	Norway	**ZW**	Zimbabwe
CI	Côte d'Ivoire	**KP**	Democratic People's Republic of Korea	**NZ**	New Zealand		
CM	Cameroon			**PL**	Poland		
CN	China	**KR**	Republic of Korea	**PT**	Portugal		
CU	Cuba	**KZ**	Kazakstan	**RO**	Romania		
CZ	Czech Republic	**LC**	Saint Lucia	**RU**	Russian Federation		
DE	Germany	**LI**	Liechtenstein	**SD**	Sudan		
DK	Denmark	**LK**	Sri Lanka	**SE**	Sweden		
EE	Estonia	**LR**	Liberia	**SG**	Singapore		

METHOD FOR DOWNLOADING SOFTWARE

The present invention relates to the field of wireless telecommunications.

More specifically, the present invention relates to a method for downloading software to a mobile telecommunications device.

The use of mobile telecommunications and its importance is rapidly increasing in both the private and business sectors. In an effort to attract new customers and to keep existing customers, network operators try to offer a variety of service options. Ideally, network operators would like to be able to introduce new services quickly and to have these services unique to their own networks.

Currently, network operators offer services such as voicemail, address books and up to date information such as stock market quotations. A user selects which services he wants when he chooses his network operator and phone. Other services may be added by contacting his network operator. Services such as stock market quotations are provided by a point to point connection with his network operator. Payment for these services is via the established Global System Mobile (GSM) infrastructure and is reflected on a monthly bill.

The present invention offers a solution to the problem of introducing new services to customers quickly and efficiently.

According to the present invention, there is provided a method for downloading software to a mobile telecommunications device said method including the steps of: broadcasting said software, receiving and

downloading said software to said mobile telecommunications device, contacting a network operator responsible for said broadcasting, and causing said network operator to enable said software such that said software is available for use by a user of said mobile telecommunications device.

According to an aspect of the present invention said step of broadcasting said software is in digital form.

According to a further aspect of the present invention said step of contacting a network operator responsible for said broadcast is via an existing point to point connection.

According to a further aspect of the present invention said step of causing said network operator to enable said software includes a further step of billing said user for said software via said existing point to point connection.

According to yet a further aspect of the present invention said step of contacting a network operator responsible for said broadcast is via an existing GSM connection.

According to a further aspect of the present invention said software is developed using a platform independent object code.

According to yet a further aspect of the present invention said platform independent object code is Java™.

Advantageously, the present invention provides a method whereby mobile network operators can make new services and updated versions of existing services available to existing customers quickly and easily without the need to seek and obtain regulatory permission.

While the principle advantages and features of the present invention has been described above a greater understanding and appreciation of the invention may be obtained by referring to the drawing and detailed description in the preferred embodiment, presented by way of example only, in which;

Figure 1 is a block diagram of the main aspects of the present invention.

In Figure 1, in which a preferred embodiment of the present invention is depicted in block diagram form, a software provider 10 is shown which has a commercial agreement with a network operator 12. The software provider designs and writes application software suitable for use with mobile telecommunications devices such as mobile phones or Personal Digital Assistants (PDAs). The software might be a new service such as voicemail systems or an applications type software package such as a word processor or a spreadsheet. The software might also be information such as a street map or the location of hospitals or police stations.

In this preferred embodiment of the present invention the software is developed using a platform independent object code thus enabling the same software to be used by a wide variety of mobile telecommunications devices. In this preferred embodiment the software is developed using the existing commercially available Java™ language. The software is written as Java™ classes capable of running on a Java™ virtual machine.

The software provider 10 enters a commercial agreement with a network operator 12 to sell or license its software to the network operator either on a fixed price, pay-per-use or other suitable payment scheme.

In order to distribute the software to its existing customers, the network operator 12 enters into a commercial agreement with a broadcaster 14. In this preferred embodiment the broadcaster is a digital broadcaster. A digital broadcaster 14 broadcasts the software using a digital broadcasting platform such as Digital Audio Broadcasting (DAB) or Digital Video Broadcasting (DVB) as a means for delivering the Java™ classes to existing network subscribers 16 of the network operator 12. As will be appreciated by those skilled in the art the existing network subscribers may be using a variety of mobile communication devices such as mobile phone or PDAs.

After downloading the Java™ class of interest, the subscriber 16 then contacts the network operator 12 via a base station 18 to establish a point to point contact with the network operator. In this preferred embodiment the point to point contact is via an existing GSM link. The network operator 12 then transmits an authentication code to the subscriber 16 via a GSM base station 18 which enables the Java™ class software to run. Upon transmission of the authentication code the network operator also arranges for the subscriber to be charged for the service on his monthly bill.

As will be appreciated the method of charging may be on a subscription basis or a pay-per-use basis. The billing information can be contained in the downloaded Java™ class broadcast by the digital broadcaster or can be sent with the authentication code via the point to point contact established between the mobile telecommunications device and the network operator via the existing GSM link.

As will be appreciated by those skilled in the art the point to point contact for authorisation and billing purposes can be established via an

existing mobile telecommunication protocol such as GSM. Alternatively, the point to point contact can be established via a third generation wireless telecommunications protocol such as Universal Mobile Terminal System (UMTS).

In the previously described embodiment of the present invention all Java™ classes are continuously broadcast over the air by the digital broadcaster. If, for example, a relatively modest data broadcast rate of 9,600 bits per second is used, then 100 services each containing 10,000 bytes of data can be fully broadcast approximately every 14 minutes. As will be appreciated, other broadcast rates could be used without departing from the scope of the present invention. New services can then be downloaded to the subscriber's mobile telecommunications device allowing the subscriber to have access to new services on demand.

In an alternative embodiment of the present invention the digital broadcaster continuously broadcasts a list of services available more frequently than the actual services themselves. The subscriber can then view the list via his mobile telecommunications device and decide which services he wants to download. The list may appear in a menu type format. Information can be encoded in a list of services such that when a particular service is selected the mobile telecommunications device automatically downloads that service the next time it is broadcast. This embodiment enables the list to be received by the subscriber more rapidly than the actual services. Once the service of interest is selected the subscriber is free to do other things while the service is automatically downloaded the next time it appears in the broadcast cycle.

In a further embodiment certain high demand services would be broadcast more often in a broadcast cycle than other services of lesser demand. Alternatively; certain priority services would be automatically downloaded immediately upon broadcast, provided sufficient memory is available on the mobile telecommunications device.

An example of a typical operation of a preferred embodiment of the present invention will now be given. The subscriber selects the option on his mobile phone to view the list of services currently available from his network operator. This list, which is continuously broadcast appears on his phone's display screen. The subscriber selects the service that he is interested in using. In response to the subscriber's selection, the phone then listens for the relevant Java™ class to be broadcast. When the phone detects the selected Java™ class the software is downloaded and installed. The menu entries now indicate that the service is loaded and available for use. The subscriber can now choose to enable the service. Upon selecting the enabling option an authentication conversation is initiated between the phone and the network operator. The network operator then sends an authorisation code to the subscriber and arranges for the subscriber to be billed for the service. The authorisation may be on a subscription of pay-per-use basis. The subscriber is now able to use the selected service.

As will be appreciated by those skilled in the art, various modifications may be made to the embodiment hereinbefore described without departing from the scope of the present invention.

As will be appreciated other mobile telecommunications devices then a phone can be used, such as PDA's or Global Positioning Systems (GPS), and are hereby incorporated within the scope of the present invention.

CLAIMS

1. Method for downloading software to a mobile telecommunications device said method including the steps of:

broadcasting said software,

receiving and downloading said software to said mobile telecommunications device,

contacting a network operator responsible for said broadcasting, and

causing said network operator to enable said software such that said software is available for use by a user of said mobile telecommunications device.

2. Method as claimed in Claim 1, wherein said step of broadcasting said software is in digital form.

3. Method as claimed in Claims 1 or 2, wherein said step of contacting a network operator responsible for said broadcast is via an existing point to point connection.

4. Method as claimed in Claim 3, wherein said step of causing said network operator to enable said software includes a further step of billing said user for said software via said existing point to point connection.

5. Method as claimed in Claims 3 or 4, wherein said step of contacting a network operator responsible for said broadcast is via an existing GSM connection.

6. Method as claimed in any preceding Claim, wherein said software is developed using a platform independent object code.

7. Method as claimed in Claim 6, wherein said platform independent object code is Java™.

8. A method for downloading software to a mobile telecommunications device as hereinbefore described with reference to the accompanying drawing.

1/1

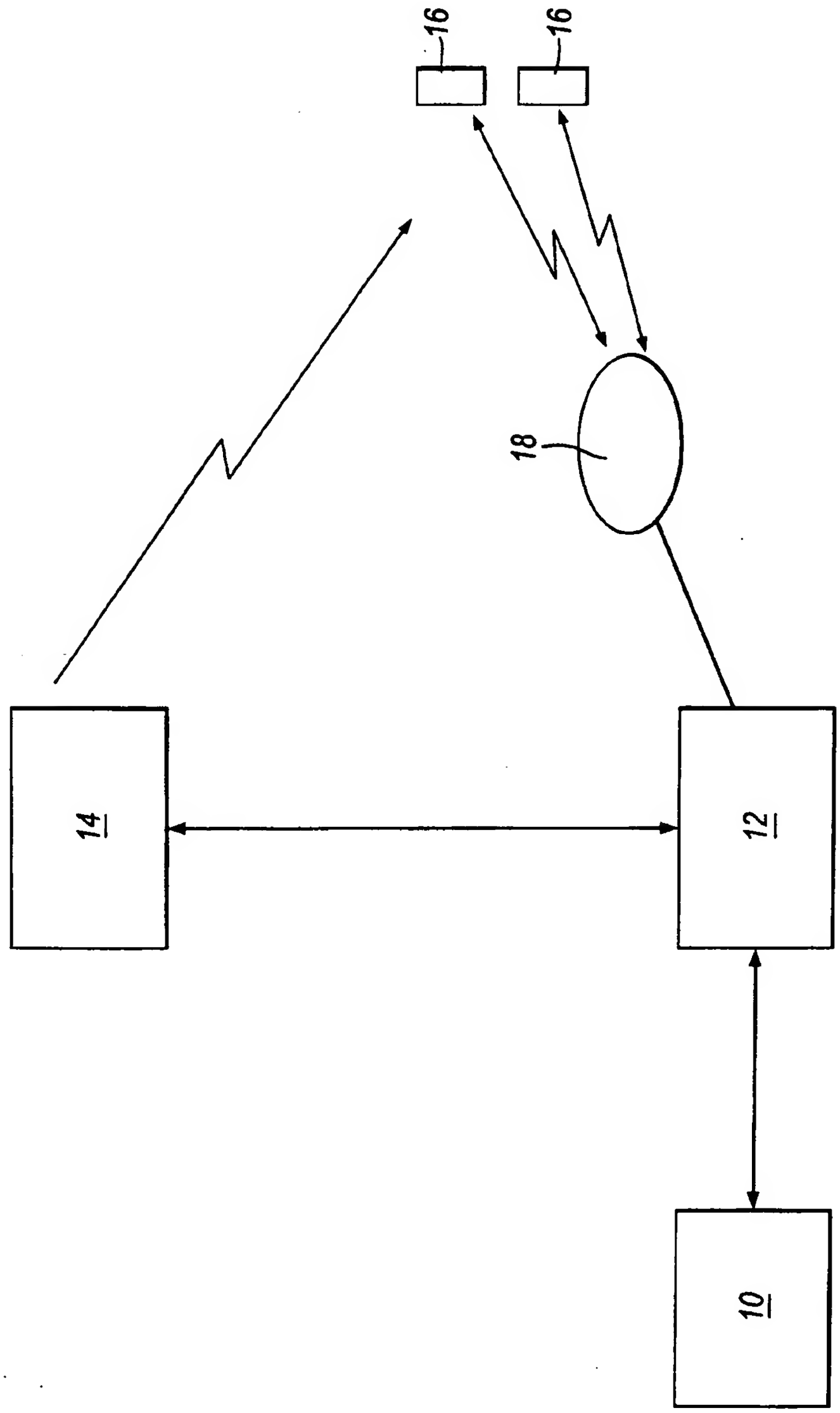


Fig.1

INTERNATIONAL SEARCH REPORT

Inte ional Application No
PCT/GB 00/00522

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 804 046 A (NOKIA MOBILE PHONES LTD) 29 October 1997 (1997-10-29) column 3, line 24 - line 40 column 5, line 14 -column 6, line 3 column 7, line 16 - line 23 claim 9 ---	1-3,5,8
A	DE 197 13 965 A (DEUTSCHE TELEKOM AG) 8 October 1998 (1998-10-08) column 1, line 19 - line 23 column 2, line 27 - line 47 column 3, line 21 - line 54 ---	1-3,5-8
A	EP 0 679 040 A (HUGHES AIRCRAFT CO) 25 October 1995 (1995-10-25) column 3, line 51 -column 4, line 26 column 13, line 58 -column 14, line 13 column 17, line 21 -column 18, line 5 --- -/--	1-3,5,8

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 May 2000	23/05/2000
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Heinrich, D

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inte. Jonal Application No
PCT/GB 00/00522

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
P,X	FR 2 775 550 A (SCHLUMBERGER SYSTEMES) 3 September 1999 (1999-09-03) page 6, line 8 - line 16 page 7, line 12 - line 19 claim 7 -----	1-8

1

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte .onal Application No
PCT/GB 00/00522

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0804046 A	29-10-1997	US 5887254 A	23-03-1999
DE 19713965 A	08-10-1998	EP 0869691 A	07-10-1998
EP 0679040 A	25-10-1995	CA 2147184 A	19-10-1995
		FI 951845 A	19-10-1995
FR 2775550 A	03-09-1999	NONE	